Communication, Navigation and Surveillance and Traffic Management Systems Center of Innovation

Volpe National Transportation Systems Center
U.S. Department of Transportation
Research and Innovative Technology Administration

Innovation for a Nation on the Move

Trends and Issues

Over the next 20 years, the Next Generation Air Transportation System (NextGen) is being deployed as one means to reduce air traffic delays. The new system involves major technology upgrades, including satellite-based navigation and surveillance systems, and replaces World War II-era ground-based radar technology with satellite operations.

COI Profile

The Communication, Navigation, Surveillance and Traffic Management Systems COI maintains and applies internationally recognized capabilities in communication, navigation, surveillance, operations management, and associated information technology disciplines to enhance the capacity, safety, and security of next-generation transportation systems. It serves as a focal point on Positioning, Navigation, and Timing (PNT) systems engineering for the civil community and fosters interagency coordination efforts.

Project Snapshots


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• Provides systems engineering and program support for the Federal Aviation Administration (FAA) Automatic Dependent Surveillance-Broadcast (ADS-B) program, a satellite-based navigation component of the Next Generation Air Transportation System that allows pilots to fly at safe distances from one another with less assistance from controllers.

• Contributes substantially to the FAA's Wake Turbulence Program, aimed at reducing the impacts of wake vortices (turbulent eddies generated by heavy aircraft) on aircraft separation standards and on closely-spaced parallel runways.


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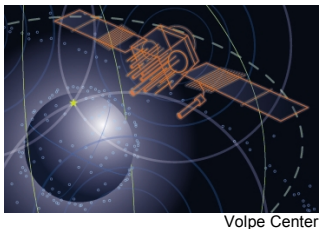
• Developed and operated the Enhanced Traffic Management System (ETMS) for FAA, a mission-essential system used for Traffic Flow Management and increasing air system capacity. The system evolved to provide new capabilities to air traffic managers, including common air traffic situational awareness that facilitates collaborative decision making among FAA, air carriers, and military operations.

• Serves as the civil lead for the Research and Innovative Technology Administration's PNT architecture effort. The architecture provides more effective and efficient PNT capabilities focused on the 2025 timeframe and an evolutionary path for government provided systems and services.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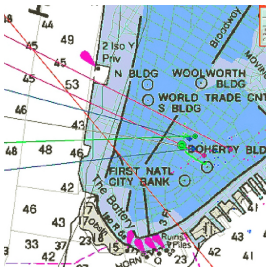
• Works with FAA to validate whether the complementary positioning and timing features of Loran and GPS can meld into a tracking system that maintains radionavigation performance standards in the urban and maritime environments.

• Develops tools and techniques for FAA Traffic Flow Management (TFM) throughout the U.S. aviation system. Focuses on future innovations for the evaluation of aviation reroutes, analysis of airport surface traffic data, and systems engineering of new technologies for congestion reduction.



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• Leads safety analysis for the implementation of procedural changes that address key runway safety issues to reduce runway incursions for FAA. Led the implementation of procedural changes that addressed high-priority issues identified by the National Transportation Safety Board for the Runway Safety Call to Action Committee.


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• Implementing prototype NextGen surface management systems for FAA, a first-ever systems collaboration between FAA and airlines aimed to relieve surface congestion. Implemented prototypes at John F. Kennedy International Airport and Memphis International Airport.

About the Research and Innovative Technology Administration

The Research and Innovative Technology Administration (RITA) coordinates U.S. DOT's research programs and is charged with advancing the deployment of cutting-edge technologies to improve our Nation's transportation system. RITA was established as a U.S. DOT Operating Administration by the Norman Y. Mineta Research and Special Programs Improvement Act of 2004.

About the Volpe Center

An innovative, Federal, fee-for-service organization, the Volpe Center, part of the U.S. DOT's RITA, is an internationally recognized center of transportation and logistics. The Volpe team represents a world-class transportation resource with multidisciplinary expertise in all modes of transportation. The Volpe Center plays a unique role in looking across the transportation enterprise to anticipate future transportation issues and challenges. The Center also has a highly skilled team of acquisition professionals. For nearly 40 years, the Volpe Center has lent critical support to all U.S. DOT's modal administrations and offices, other Federal agencies, state and local governments and organizations, foreign governments and entities, and the private sector.

The Volpe Center is organized into eight Centers of Innovation (COI). Each COI applies its technical capabilities to U.S. DOT strategic goals and national transportation priorities. The COIs expand U.S. DOT's horizon and show how innovation can arise from creative and collaborative use of internal and external assets. The COIs include:

- **Multimodal Systems Research and Analysis**
- **Safety Management Systems**
- **Environmental and Energy Systems**
- **Freight Logistics and Transportation Systems**
- **Physical Infrastructure Systems**
- **Communication, Navigation, Surveillance (CNS) and Traffic Management Systems**
- **Human Factors Research and System Applications**
- **Advanced Vehicle and Information Network Systems**

For more information

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